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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,653	03/28/2006	Koichi Nittoh	288707US2PCT	5673

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EXAMINER	
ELEY, JESSICA L	

ART UNIT	PAPER NUMBER
2884	

NOTIFICATION DATE	DELIVERY MODE
03/24/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/573,653	NITTOH ET AL.	
	Examiner	Art Unit	
	JESSICA L. ELEY	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *28 March 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Art Unit: 2884

DETAILED ACTION

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

Claims 1-4 are objected to because of the following informalities: lines 3 and 4 of the corresponding claims states "havng either of an acicular crystal structure…" when "*having* either *one* of an acicular crystal structure…" is probably what is meant. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kusuyama et al. US 2001/0054694 A1 (henceforth referred to as Kusuyama) and further in view of Nittoh et al. (US 6,313,465 B1 (henceforth referred to as Nittoh).

Regarding claims 1, Kusuyama teaches a scintillator comprising: an optical substrate having bundled optical fibers **12, 14**; an acicular scintillator **12, 14** provided with the optical substrate, the acicular scintillator having either of an acicular crystal structure, when layer **18** is considered part of the structure, and a columnar crystal structure (¶0027), the acicular scintillator reacting to a radial ray such as X-rays (¶0064) and emitting light;

Kusuyama does not teach a coating scintillator that reacts with a different color from an emitting color in the acicular scintillator to either another electromagnetic wave or another radial ray, which differ in either of energy and a type from the electromagnetic wave or the radial ray that the acicular scintillator reacted to. Instead the scintillator **18** taught by Kusuyama is adapted to emit visible light when X-rays are incident thereon, however Kusuyama does specify that this scintillator is not restrictive (¶0064), thus anticipating the use of other scintillating materials for scintillating layer **18**.

Nittoh teaches a scintillator composed of layers **7, 8, and 9** that respond to different types of radiation with different color, thus teaching a coating scintillator that reacts with at least one of another electromagnetic wave and another radial ray which differ in either of an energy and a type from the electromagnetic wave and the radial ray, reacting with the acicular scintillator into light emitting in a different color from an emitting color in the acicular scintillator. It would be obvious for a person of ordinary skill in the art at the time the invention was made to use the scintillator composed of layers **7, 8, and 9** taught by Nittoh as the scintillator **18** in the detector taught by Kusuyama since Kusuyama anticipates

the use of other scintillating materials (¶0064), and the scintillator taught by Nittoh has the added benefit of responding to multiple types of radiation (column 12 lines 5-19).

Regarding claims 2-4, Kusuyama and Nittoh teach the apparatus as taught in claim 1 discussed above. Furthermore the scintillating layers **7, 8, and 9** (coating scintillator) taught by Nittoh used as the scintillator **18** in Kusuyama for reasons discussed above, are constructed from layers of gadolinium oxysulfide doped with different elements with different thicknesses so as to react to different radiation types, i.e. different emitting condition, with different colored emissions (column 12 lines 5-19) and thus inherently emit with a different emission lifetime from those of the acicular scintillator **12, 14**.

Regarding claim 5, Kusuyama (FIG. 1) and Nittoh (FIG. 4) teach an image sensor comprising the scintillator as described in claims 1, 2, and 3, as discussed above. Furthermore, Kusuyama teaches the image sensor comprising: a photosensor **20** receiving light generated by the color scintillator to convert the light into an electrical signal, the photosensor **20** uses image processing (i.e. timing and filtering) and the like so that the radiation image can be obtained (¶0052).

Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kusuyama et al. US 2001/0054694 A1 (henceforth referred to as Kusuyama) and Nittoh et al. (US 6,313,465 B1 (henceforth referred to as Nittoh), and further in view of Berninger US 3,890,506.

Regarding claims 6 and 7, Kusuyama (FIG. 1) and Nittoh (FIG. 4) teach an image sensor comprising the scintillator as described in claims 1, 2, and 3, as discussed above. Furthermore, Kusuyama teaches a photosensor **20** receiving light generated by the color scintillator to convert the light into an electrical signal. The use of the image intensifier as taught by Nittoh (column 15 lines 1-4) with the image sensor and photosensor taught by Kusuyama is obvious to a person of ordinary skill in the art at the time the invention was made since a person of ordinary skill has good reason to pursue the known options within his

or her technical grasp, and as noted by Nittoh the image intensifier improves sensitivity (column 15 lines 1-4).

For purposes of clarification Berninger is cited as an example of an image intensifier, known in the art, that is taught can improve the sensitivity of the image from the scintillating layers as taught by Nittoh. As can be seen an image intensifier comprises a photoelectric face **12** of which a curvature forms an electron lens, electrical-signal-amplify-means (Berninger, electrodes **15, 15a, and 17**) for amplifying the electrical signal by accelerating electrons with the operation of an electric field and an output scintillator **32** converting the electrical signal amplified by the electrical-signal-amplifying-means into an image, the output scintillator having a curvature (FIG. 3) forming another electron lens in a side of the photoelectric face.

Regarding claim 8, Kusuyama (FIG. 1) and Nittoh (FIG. 4) teach an image sensor comprising the scintillator as described in claims 1, 2, and 3, as discussed above, and with reference to Berninger, an image intensifier as discussed in claims 6 and 7 above. Since Nittoh teaches the use of the image intensifier interposed between the scintillator and the light receiving devices (column 15 lines 1-4), it is understood the device, as made obvious by Kasayuma and Nittoh, remains unchanged in the parts preceding the scintillator in the direction of radiation propagation. As a result of this configuration the color scintillator taught by Nittoh would remain flat, while as Berninger teaches it is the convention to curve the input window and thus the photocathode film **12** (column 13 lines 43-45).

Regarding claim 9, Kusuyama, Nittoh, and Berninger teach the image sensor described in claim 8, furthermore, Berninger teaches a flat fluorescent output surface **35** on the output scintillator **32** (FIG. 3).

Regarding claim 10, Kusuyama, Nittoh, and Berninger teach the image sensor described in claim 8, furthermore, Berninger teaches the image intensifier being formed in an evacuated inner housing, i.e. vacuum vessel **10**.

Regarding claim 11, Kusuyama, Nittoh, and Berninger teach the image sensor described in claim 8, furthermore, since the scintillator **7, 8, and 9** taught by Nittoh forms an image constituted with a light of red, green, and blue it would be obvious to person of ordinary skill in the art that the corresponding output scintillator would constructed an image constituted with a light of which a luminescence ratio of red, green, and blue varies according to intensities of electrons in order to take advantage of the colored scintillator taught by Nittoh.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA L. ELEY whose telephone number is (571)272-9793. The examiner can normally be reached on Monday - Thursday 8:00-6:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Constantine Hannaher/
Primary Examiner, Art Unit 2884

/J. L. E./
Examiner, Art Unit 2884